

We claim:

1. A failure diagnostic system for an exhaust pressure increasing device, comprising:

an intake channel and an exhaust channel in communication with cylinders of an internal combustion engine;

the exhaust pressure increasing device that increases an exhaust system pressure of said exhaust channel;

an intake system pressure detecting device provided in said intake channel, for detecting an intake system pressure; and

an exhaust pressure increase failure diagnostic section that determines as to whether the exhaust pressure increasing device has failed according to intake system pressure information obtained by said intake system pressure detecting device and a predetermined failure diagnosis reference range.

2. A failure diagnostic system according to claim 1, wherein said exhaust pressure increase failure diagnostic section compares the intake system pressure information and the predetermined failure diagnosis reference range, and determines that the exhaust pressure increasing device has failed when a maximum value of the intake system pressure in a predetermined period of time from a starting time point of communication between a combustion chamber in the cylinders and said intake channel lies outside the predetermined failure diagnosis reference range.

3. A failure diagnostic system according to claim 2, further comprising:

a failure notifying device that notifies a failure,

wherein said failure notifying device notifies a failure when said exhaust pressure increase failure diagnostic section determines that the exhaust pressure increasing device has failed.

4. A failure diagnostic system according to claim 1, further comprising:

an intake valve and an exhaust valve that open and close an intake opening and an exhaust opening, respectively, of a combustion chamber in the cylinders; and

a valve timing changing device that changes at least one of valve closing timing of said exhaust valve and valve opening timing of said intake valve,

wherein said exhaust pressure increase failure diagnostic section determines as to whether the exhaust pressure increasing device has failed when an amount of overlap of the valve closing timing of said exhaust valve and the valve opening timing of said intake valve is equal to or greater than a predetermined amount.

5. A failure diagnostic system according to claim 4, wherein said exhaust pressure increase failure diagnostic section determines as to whether the exhaust pressure increasing device has failed according to the intake system pressure information obtained when the amount of overlap is equal to a reference amount of overlap.

6. A failure diagnostic system according to claim 4, wherein:

the exhaust pressure increase failure diagnostic section comprises a subject converting section that carries out conversion of a subject of comparison in making the determination as to whether the exhaust pressure increasing device has failed; and

said subject converting section carries out conversion of the subject of comparison by correcting the intake system pressure information to a low voltage side or the predetermined failure diagnosis reference range to a high

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reference side when the amount of overlap is great, and correcting the intake system pressure information to a high voltage side or the predetermined failure diagnosis reference range to a low reference side when the amount of overlap is small.

7. A failure diagnostic system according to claim 4, wherein:

the exhaust pressure increase failure diagnostic section comprises a subject converting section that carries out conversion of a subject of comparison in making the determination as to whether the exhaust pressure increasing device has failed; and

said subject converting section carries out conversion of the subject of comparison by correcting the intake system pressure information to a low voltage side or correcting the predetermined failure diagnosis reference range to a high reference side when a valve opening speed of said intake valve, a load applied to the internal combustion engine, or a flow rate of exhaust in said exhaust channel is high, and correcting the intake system pressure information to a high voltage side or correcting the predetermined failure diagnosis reference range to a low reference side when the valve opening speed, the load, or the flow rate is low.

8. A vehicle including an internal combustion engine comprising:

an intake channel and an exhaust channel in communication with cylinders of an internal combustion engine;

an intake valve and an exhaust valve that open and close an intake opening and an exhaust opening, respectively, of a combustion chamber in the cylinders;

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a valve timing changing device that changes at least one of valve closing timing of said exhaust valve and valve opening timing of said intake valve;

an exhaust pressure increasing device that increases an exhaust system pressure of said exhaust channel;

an intake system pressure detecting device provided in said intake channel, for detecting an intake system pressure; and

an exhaust pressure increase failure diagnostic section that determines as to whether the exhaust pressure increasing device has failed according to intake system pressure information obtained by said intake system pressure detecting device and a predetermined failure diagnosis reference range when an amount of overlap of the valve closing timing of said exhaust valve and the valve opening timing of said intake valve is equal to or greater than a predetermined amount.